Aligning Items and Achievement Levels: A Study Comparing Expert Judgments

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Overview of presentation

- Goal of developing achievement level descriptions
- Importance of aligning items to achievement levels
  - Identifying difficulty drivers to improve item-ALD alignment
- Current study: Piloted a methodology to work with SMEs to identify difficulty drivers
  - Results and discussion of next steps

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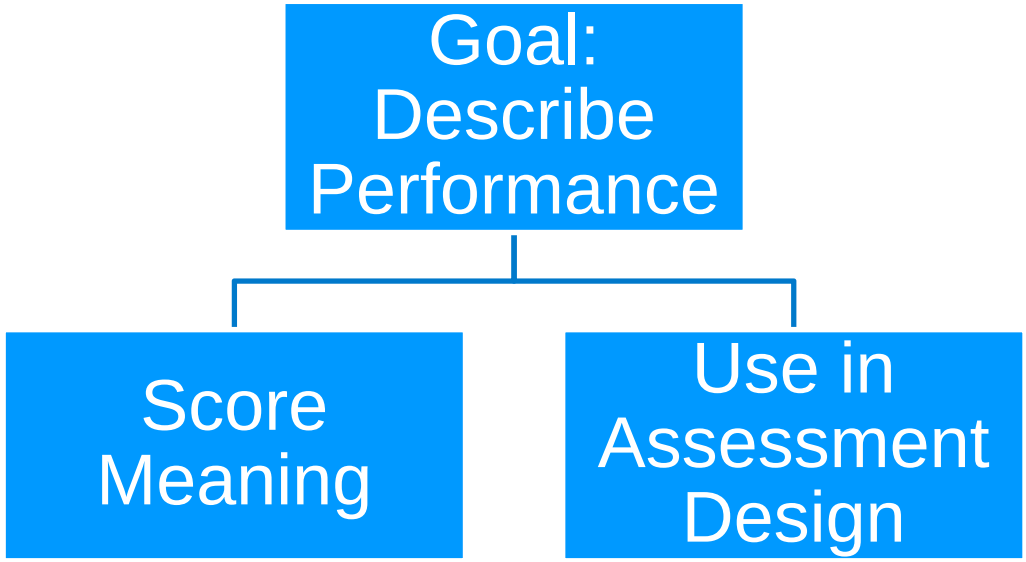
Achievement Level Descriptions in K-12 Testing

- ALDs = description of what students know and can do at a particular level
  - Describe how performance differs for students in each category



e.g., Huff & Plake, 2010

ALDs and item development

- When aim is to reliably classify students into performance levels, must design items capable of discriminating student performance
  - Write items to intended ALD levels (e.g., AP ALDs for 1, 2, 3, 4, 5)
- What item design features relate to ALDs?
- If items are designed w/o goal of classification and alignment, there is risk that the student performance on an exam will not align with intended interpretation
  - Especially important for tests with MC items (e.g., AP exams)

e.g., Schneider et al., 2010

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Difficulty drivers

- Alignment between items and ALDs is difficult to achieve! We need to understand what item features are driving the difficulty/complexity of an item
- Identifying **difficulty drivers** for use in item development is the key to achieving this alignment.
- Can you really predict item difficulty?
  - NO. The relationship between item difficulty and achievement level will never be perfect, but we certainly can identify item features that relate to item difficulty
  - Should be a negative relationship between p-values and performance levels

e.g., Barry & Huff, 2009

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Relationship between item difficulty and achievement level

Purpose of study

To pilot a new methodology for identifying difficulty drivers with SMEs for AP US History. This exam is currently undergoing a redesign project using evidence-centered assessment design.

RESEARCH QUESTIONS:

1) What item features make items more or less difficult for this AP US History exam?

2) Did the methodology employed in this particular item alignment workshop elicit relevant difficulty drivers?

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Methods: Participants and Pre-meeting assignment

- 4 strongly recommended SMEs in United States history were recruited to participate in a 1.5 day workshop.
  - 2 high school, 2 college
- Pre-meeting assignment, SMEs were asked to classify AP US History items to ALD level
  - 18 items
  - Drafted ALDs
  - Spreadsheet for homework responses

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Methods: 1.5 day workshop

- Detailed review of 9 of the 18 items
  - The intended ALD level and skills were revealed.
  - Results of the SME classifications were presented, and the SMEs discussed their rationales with one another.
  - Presentation of actual student performance data from the item pilots.
    - Item difficulty data (percentage of students who got the item correct)
    - Opportunity to learn data (percentage of teachers who currently teach the content and/or skills necessary to correctly answer the item) were presented.

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Methods: 1.5 day workshop, continued

- After sufficient discussion, the research question "What features make items more or less difficult?" was projected on a screen in front of the room
- A list of "difficulty drivers" was documented and saved.
- Evaluation survey
- Follow up assignment after meeting to confirm what was documented during the meeting

Results: Draft taxonomy of difficulty drivers

- Item characteristics
  - Degree of scaffolding
  - Word count
  - Vocabulary unrelated to target of measurement
  - Number of components to an item
- Target of measurement characteristics
  - Degree of familiarity
  - Plausibility of distracters

Discussion

- "Difficulty drivers" that emerged using this method with SMEs were not really related to historical sources of cognitive complexity
- Underscores how difficult this process can be, particularly for this domain!
  - *How can we better elicit difficulty drivers related to the domain?*
- Evaluation survey was helpful—SMEs valued experience and this research, were clear on goals of the meeting
  - Indicated that this is a difficult task

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Possible suggestions for future

- Add a learning scientist
- Add an additional piece of pre-meeting work, to have SMEs beginning to think about difficulty drivers in advance
- Increase the length of the meeting
- ALD workshop
- WHAT ELSE?

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